

Appl. S.N. 10/063,807
Amdt. Dated August 2, 2005
Reply to Office Action of May 2, 2005

RD-29640-2

The listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Original) A method for acquiring images using a magnetic resonance imaging (MRI) system, the method comprising:

applying a plurality of steady-state free precession (SSFP) radio-frequency (RF) excitation pulses in a selected pattern of varying amplitudes and phases, the pulses having substantially equal spacing between all neighboring pulses and between successive groups of pulses; and,

reading a plurality of signals corresponding to the pulses and wherein the signals are substantially immune to magnetic field inhomogeneity of the MRI system..

2. (Original) The method of claim 1 wherein the pattern is three pulses occurring at $90^\circ(x)$, $180^\circ(-x)$ and $90^\circ(x)$.

3. (Original) The method of claim 1 wherein the pattern is three pulses occurring at $90^\circ(y)$, $180^\circ(x)$, $90^\circ(-y)$.

4. (Original) The method of claim 1 wherein the pattern is pulses occurring at $90^\circ(y)$, $180^\circ(x)$, $180^\circ(x)$, $180^\circ(x)$, $180^\circ(x)$, $90^\circ(-y)$.

5. The method of claim 1 wherein the pattern is pulses occurring at $90^\circ(y)$, $180^\circ(x)$, $180^\circ(-x)$, $180^\circ(-x)$, $180^\circ(x)$, $90^\circ(-y)$.

6. (Original) The method of claim 1 wherein the pattern is pulses occurring at $90^\circ(y)$, $180^\circ(x)$, $180^\circ(x)$, $180^\circ(-x)$, $180^\circ(-x)$, $90^\circ(-y)$.

7. (Original) The method of claim 1 further comprising the step of inserting gradient spoiler pulses in a period when magnetization is oriented predominantly in a longitudinal direction.

8. (Original) A system for Magnetic Resonance Imaging (MRI) for acquiring images of an object comprising:

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a magnetic field driver for driving a field gradient;

a magnetic field controller for controlling the magnetic field;

a transmitter for generating an radio frequency (RF) pulse to cause resonance and wherein the transmitter is adapted to generate a plurality of steady-state free precession (SSFP) radio-frequency (RF) excitation pulses in a selected pattern of varying amplitudes and phases, the pulses having substantially equal spacing between all neighboring pulses and between successive groups of pulses; and,

a receiver for receiving and detecting magnetic resonance signals generated from the object, the receiver being further adapted to read a plurality of signals corresponding to the pulses and wherein the signals are substantially immune to magnetic field inhomogeneity of the MRI system; and,

a processor for performing image reconstruction and for generating images for display.

9. (Original) The system of claim 8 wherein the transmitter is adapted to generate the selected pattern having three pulses occurring at $90^\circ(x)$, $180^\circ(-x)$ and $90^\circ(x)$.

10. (Original) The system of claim 8 wherein the transmitter is adapted to generate the selected pattern having pulses occurring at $90^\circ(y)$, $180^\circ(x)$, $180^\circ(x)$, $180^\circ(x)$, $180^\circ(x)$, $90^\circ(-y)$.

11 (Original) The system of claim 8 wherein the transmitter is adapted to generate the selected pattern three pulses occurring at $90^\circ(y)$, $180^\circ(x)$, $180^\circ(-x)$, $180^\circ(-x)$, $180^\circ(x)$, $90^\circ(-y)$.

12. (Original) The system of claim 8 wherein the transmitter is adapted to generate the selected pattern having pulses occurring $90^\circ(y)$, $180^\circ(x)$, $180^\circ(x)$, $180^\circ(-x)$, $180^\circ(-x)$, $90^\circ(-y)$.